CS230, Deep Learning Handout #2, Syllabus

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Syllabus: (10 weeks)

- 1. Foundations of Neural Networks (2 weeks)
 - I Introduction to deep learning
 - II Neural networks basics
 - III Shallow neural networks
 - IV Deep neural networks
- 2. Improving Deep Neural Networks (2 weeks)
 - I Practical Aspects of deep learning
 - II Optimization algorithms
 - III Hyperparameter tuning, Batch Normalization and Programming Frameworks
- 3. Structuring Machine Learning Projects (1 week)
 - I ML Strategy, Setting up your goal, human level performance
 - II Error Analysis, Mismatched training and dev/test distributions, learning for multiple tasks, end-to-end deep learning
- 4. Convolutional models (1.5 weeks)
 - I Convolutional neural networks
 - II Computer vision applications
- 5. Sequence models (2.5 weeks)
 - I RNN, LSTM, GRU models
 - II Application to NLP
 - III Application to Speech recognition
- 6. Case studies (1 weeks)
 - I In-depth discussion of DL examples
 - II Discussion of student projects

Course Materials

If you have been accepted in CS230, you must have received an email from Coursera confirming that you have been added to a private session of the course "Neural Networks and Deep Learning". Follow the instructions to setup your Coursera account with your Stanford email.

On the Coursera platform, you will find:

- Lecture videos which are organized in "weeks". You will have to watch around 10 videos (more or less 10min each) every week. Make sure you are up to date, to not loose the pace of the class.
- Quizzes (10-30min to complete) at the end of every week. These quizzes are here to assess your understanding of the material.
- Programming assignments (2h per week to complete). The programming assignments will usually lead you to build concrete algorithms, you will get to see your own result after you've completed all the code. It's gonna be fun!

You will follow the following schedule, week by week, and have lectures on Monday. These lectures will be a mix of advanced lectures on a specific subject that hasn't been treated in depth in the videos, guest lectures from industry experts or discussion sessions where you get to ask questions. We will announce the next lecture along the quarter.

Course schedule

You will complete 5 courses:

- Course 1: "Neural Networks and Deep Learning" (4 modules)
- Course 2: "Improving deep neural networks" (3 modules)
- Course 3: "Strategies for Machine Learning projects" (2 modules)
- Course 4: "Convolutional models" (3 modules)
- Course 5: "Sequence models" (4 modules)

We will use CXMY to denote "Course X Module Y". Completing a module means watching the videos, completing the quiz and the programming assignment(s). The deadline to complete a module is 9:00AM on Monday each week.

- 09/25-10/02:
 - C1M1 ("Introduction to deep learning")
 - C1M2 ("Neural network basics")
- 10/02-10/09:
 - C1M3 ("Shallow neural network")
 - C1M4 ("Deep neural networks")
- 10/09-10/16:
 - C2M1 ("Practical aspects of deep learning")

- Project proposal deadline 10/16 11:59pm
- 10/16-10/23:
 - C2M2 ("Optimization algorithms")
 - C2M3 ("Hyperparameter tuning, batch normalization and programming frameworks")
- 10/23-10/30:
 - C3M1 ("ML Strategy (1)")
 - C3M2 ("ML Strategy (2)")
- 10/30-11/06:
 - C4M1
 - C4M2
- 11/06-11/13:
 - C4M3
 - C5M1
- 11/13-11/17:
 - C5M2
 - Project Milestone deadline: 11/17 at 23:59pm
- Thanks giving break!
- 11/27-12/04:
 - C5M3
 - C5M4
- 12/04-12/11:
 - Project week
- 12/04-12/13:
 - Final presentation $12/11,\,11{:}30\mathrm{am}{-}12{:}50\mathrm{pm}$
 - Final project submission deadline: 12/12, 11:59pm